Gastric Tube Placement in Children 1-215 Months Old

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Feeding by a nasogastric/orogastric (NG/OG) tube is preferred when the gastrointestinal system is functional and the need for assisted feeding is expected to be short-term. Preliminary studies in children show that between 21% and 44% of these tubes are placed incorrectly. When tubes are out of place, children can be seriously harmed, causing increased morbidity and occasionally death.

The aims of this study were to determine the best method to predict the insertion distance for placing NG/OG tubes and to determine the best clinical methods of testing the location of NG/OG tubes once they were inserted. A randomized clinical trial was conducted.

The three insertion-distance prediction methods tested were nose-ear-xiphoid (NEX); nose-ear-mid-umbilicus (NEMU); and age-related, height-based (ARHB). An abdominal radiograph was obtained immediately following tube insertion to determine the internal location of the tube tip and orifice(s).

Based on data from 95 children age 1-220 months (M = 51.8, SD = 54.9, median = 33.4), both the ARHB and NEMU methods were superior to NEX in placing the tube in the stomach (p = .0064). ARHB and NEMU were not significantly different from each other. NEX was frequently too short (41.93% of tube insertions) leaving the tube tip and/or orifices in the esophagus.

The three clinical methods of testing tube location were CO_2 monitoring and measuring pH and bilirubin in tube aspirate. Measuring pH of tube aspirate was the superior clinical method of determining tube location. Aspirate was available for testing in 84 children (88.42%). Based on a pH cutoff of 5 (recommended by Metheny in fasting adults), the sensitivity was 26.67 (low), specificity was 80.60 (high), positive predictive value was 23.53 (low), and negative predictive value was 83.08 (high).

Measuring the NEX distance is the method most commonly used by nurses in practice; therefore, based on the results of this study and studies of other researchers, a practice change to either ARHB or NEMU should improve the safety of enteral feeding in children. Because of the low sensitivity in predicting misplaced tubes using pH, the superior clinical method, obtaining an abdominal x-ray to ensure placement in the stomach at the time of tube insertion is recommended.